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OKLAHOMA GEOLOGICAL SURVEY

Governor Robert L. Williams, State Superintendent R. H. Wilson,
President Stratton D. Brooks, Commission
C. W. Shannon, Director

BULLETIN NO. 25.

BIBLIOGRAPHY
OF
OKLAHOMA GEOLOGY
WITH
SUBJECT INDEX.

BY
L. E. TROUT and GEO. H. MYERS.

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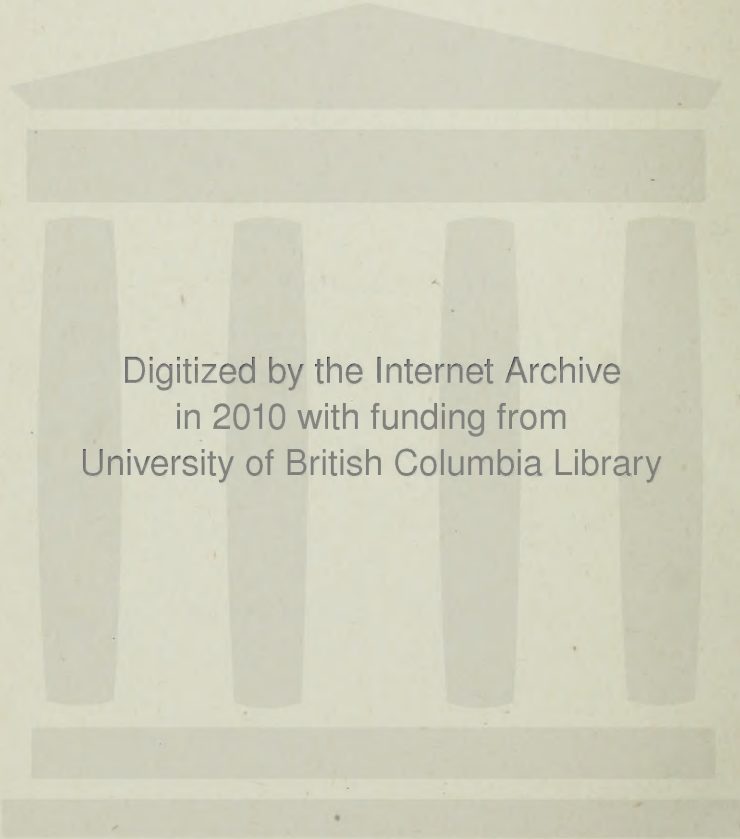
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**NORMAN
July, 1915.**



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CONTENTS.

	Page
Introduction	5
Serials examined	7
Bibliography	10
Index	81

BIBLIOGRAPHY OF OKLAHOMA GEOLOGY WITH SUBJECT INDEX.

INTRODUCTION.

The bibliography of Oklahoma geology, including paleontology, petrology, and mineralogy, is intended to be complete for the years 1791 to 1915, inclusive, up to the time of publication. It must be understood, however, it is possible that some papers, which should have been included, have escaped notice of the compilers. Besides the publications pertaining directly to Oklahoma, practically all articles bearing directly upon Kansas, southeastern Missouri, western Arkansas, northeastern Louisiana, northern Texas, and southeastern Colorado are included. References to Oklahoma geology found in text books are, as a rule, omitted.

Following the plan of similar publications of the United States Geological Survey, the papers, with full title and medium of publication and explanatory notes (where necessary) are listed under the authors, arranged in alphabetical order. Following the authors' list, which is numbered consecutively, is an index to the papers listed. The entries in this index are of three kinds: first, subject, with various subdivisions; second, titles of papers, of which many are abbreviated or inverted under their leading words; and third, cross references, which have been used to avoid too much repetition.

The assistance of Chas. N. Gould, D. W. Ohern, L. L. Hutchinson, Chas. W. Hamilton, Harve Loomis, C. W. Shannon, and L. C. Snider has done much to expedite the preparation of this publication, and is gratefully acknowledged by the compilers.

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INDEX.

[The numbers refer to entries in the bibliography.*]

- Ada oil and gas pool: Trout and Shannon, 569.
- Adair oil and gas pool: Blatchley, 66; Snider, 513; Trout and Shannon, 569.
- Adair County.**
- Oil and gas conditions: Snider, 513; Trout and Shannon, 569.
- Road materials: Snider, 505.
- Structural materials: Gould *et al.*, 256.
- Addresses.**
- Future of natural gas: Gould, 224.
- Electricity and irrigation: Dwight, 169.
- Geological resources of Oklahoma and Carter County: Gould, 239.
- Oklahoma among the Southern States: Gould, 247.
- Aegirite and riebeckite rocks: Rogers, 460a.
- Albertite-like asphalt. *See* Asphalt.
- Alfalfa County.**
- Oil and gas conditions: Snider, 513; Trout and Shannon, 569.
- Road materials: Snider, 505.
- Salt: Gould *et al.*, 253, 255; Snider, 514.
- Structural materials: Gould *et al.*, 256.
- Allen oil and gas pool: Trout and Shannon, 569.
- Alluvial springs. *See* Springs.
- Alluvium: Gould, 228; Munn, 401; Taff, 557.
- Alluwe oil and gas pool: Hutchison, 343; Siebenthal, 495; Snider, 513; Trout and Shannon, 569.
- Altamont limestone: Hutchison, 343; Ohern and Garrett, 419; Reeds, 448; Shannon and Trout, 482; Snider, 513.
- Altova dolomite: Gould, 222.
- Amphitheater dolomite: Willis, 619.
- Analyses.**
- Asphalt: Aurin, 27; Porter, 429; Snider, 510; Taff, 558.
- Clays: Snider, 504.
- Coal: Lord, 376; Porter, 429; Shannon, 481; Taff, 554; Taff and Adams, 562.
- Glass sand: Buttram, 100.
- Granite: Taylor, 566.
- Gypsum: Gould *et al.*, 256; Snider, 514.
- Natural gas: Blatchley, 66.
- Petroleum: Blatchley, 66; Buttram, 102; Day, 164; Hutchison, 343; Shannon and Trout, 482; Smith, 499; Snider, 513; Taff and Reed, 563.
- Portland cement: Nelson, 406; Siebenthal, 495.
- Salt: Snider, 514.
- Volcanic dust: Buttram, 101.
- Water: Gould, 228.
- Anglesite. *See* Lead.
- Anhydrite. *See* Gypsum.
- Antelope Hills: Sherwin, 486.
- Anticlinal theory: Buttram, 102; Hutchison, 343; Shannon and Trout, 482.
- Apache sulphur spring: Gould, 228.
- Aplite: Taff, 552.
- Arbuckle anticline: Reeds, 450; Taff, 552.

*The numbers in this index, with few exceptions, refer only to articles bearing directly upon Oklahoma. Scientific magazine and newspaper articles, while referring to Oklahoma, have in some cases been omitted.

Arbuckle limestone: Eckel, 171; Gould, 228; Hutchison, 343; Reeds, 450; Shannon and Trout, 482; Snider, 504, 505, 509; Taff, 542, 545, 552, 553; Taff and Reed, 563; Trout, 568; Wallis, 585; Willis, 619.

Paleontology: Taff, 545.

Arbuckle Mountain Region.

General geology: Brady, 67; Eckes, 172; Gould, 221, 228, 239; Gould *et al.*, 256; Hutchison, 343; Reeds, 450, 451; Shannon and Trout, 482; Snider, 504, 505, 513; Taff, 540, 542, 545, 552; Vaughan, 581; Wallis, 585; Willis, 619.

Economic geology: Buttram, 99, 100; Gould, 248; Gould *et al.*, 253, 256; Hutchison, 343; Nelson, 406; Porter, 429; Reeds, 450; Shannon and Trout, 482; Snider, 505, 509, 510; Taff, 542, 545, 552; Taylor, 566; Wallis, 585; Willis, 619.

Igneous rocks: Reeds, 450; Snider, 505; Taff, 552; Taylor, 566.

Paleontology: Girty, 196, 201; Reeds, 449, 451; Taff, 552; Trout, 568.

Archean. *See* Pre-Cambrian.

Ardmore, asphalt: Belt, 63; Porter, 429; Snider, 505.

Ardmore, coal: Taff, 550.

Arkansas River: Abert, 1; Gould, 228; Hinderlider *et al.*, 328, 329; Taff, 541.

Arkansas Valley: Gould, 228; Keyes, 356; Taff, 541, 542, 555, 557; Taff and Adams, 562; Willis, 619.

Artesian water. *See* Underground water.

Asphalt.

General: Aurin, 27; Belt, 63; Fuller, 183; Gould, 234, 241; Gould *et al.*, 253, 255; Hutchison, 343; Porter, 429; Shannon, 481; Snider, 505, 510, 512; Taff, 535, 545, 558, 560.

Analyses. *See under* Analyses.

Lands: Taff, 551.

Paving, Hutchison, 343; Snider, 505, 510.

Refining: Crane, 139.

Atoka County.

Asphalt, Hutchison, 343; Taff, 558.

Coal: Taff, 541, 542, 550; Willis, 619.

Oil and gas conditions: Snider, 513; Trout and Shannon, 569.

Road materials: Snider, 505.

Structural materials: Gould *et al.*, 256.

Atoka formation: Hutchison, 343; Shannon and Trout, 482; Smith, 498; Snider, 504, 515; Taff, 541, 542, 552, 558; Wallis, 585; Willis, 619.

Atoka oil and gas pool: Snider, 513; Trout and Shannon, 569.

Atoka quadrangle: Taff, 542.

Auger conglomerate lentil: Munn, 401.

Avant limestone: Ohern, 416; Shannon and Trout, 482; Snider, 505; Wood, 632.

Avant oil and gas pool: Hutchison, 343; Snider, 513; Trout and Shannon, 569.

Backbone anticline: Smith, 498; Snider, 515; Taff, 549; Taff and Adams, 562.

Backbone fault: Smith, 498; Snider, 515; Taff and Adams, 562.

Bald Hill oil and gas pool: Blatchley, 66; Hutchison, 343; Trout and Shannon, 569.

Bandera shale: Adams *et al.*, 20, 21; Hutchison, 337; Nelson, 406; Ohern and Garrett, 419; Reeds, 448; Schrader and Haworth, 471; Shannon and Trout, 482; Siebenthal, 495.

Bartlesville oil and gas pool: Blatchley, 66; Hutchison, 343; Long, 374; Severin, 478; Siebenthal, 495; Snider, 513; Trout and Shannon, 569.

Bartlesville sand: Buttram, 102; Smith, 499; Snider, 513; Trout and Shannon, 569.

Bartlett oil and gas pool: Trout and Shannon, 569.

Beaver County.

Oil and gas conditions: Snider, 513; Trout and Shannon, 569.

Road materials: Snider, 505.

Beaver County.—(Continued.)

Structural materials: Gould *et al.*, 256.

Volcanic dust: Buttram, 101.

Water supply: Gould, 228.

Beckham County.

Gypsum: Gould *et al.*, 255, 256; Shannon, 481; Snider, 514.

Oil and gas conditions: Snider, 513; Trout and Shannon, 569.

Road materials: Snider, 505.

Salt: Gould *et al.*, 253, 255; Snider, 514.

Structural materials: Gould *et al.*, 256.

Beggs oil and gas pool: Snider, 513; Trout and Shannon, 569.

Beggs, structural reconnaissance: Fath, 176.

Belton anticline: Taff, 542, 552.

Bennington limestone: Larkin, 368; Nelson, 406; Shannon and Trout, 482; Snider, 505; Taff, 542, 545.

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North American geology, 1886; Darton, 150.

North American geology, 1887-1889, inclusive: Darton, 151.

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North American geology, 1906-1907: Weeks and Nickles, 602.

North American geology, 1908: Nickles, 410.

North American geology, 1909: Nickles, 411.

North American geology, 1910: Nickles, 412.

North American geology, 1911: Nickles, 413.

North American geology, 1912: Nickles, 414.

North American geology, 1913: Nickles, 415.

Big Blue series: Willis, 619.

Bigheart oil and gas pool: Snider, 513; Trout and Shannon, 569.

Big lime: Smith, 499.

Bird Creek beds: Hutchison, 337.

Bird Creek oil and gas pool: Blatchley, 66; Snider, 513; Trout and Shannon, 569.

Biswell Hill anticline: Smith, 498.

Bitumens. *See* Asphalt.

Bixby oil and gas pool: Trout and Shannon, 569.

Black mesa: Gould, 228; Gould *et al.*, 256.

Blackwell oil and gas field: Blatchley, 66; Hutchison, 343; Snider, 513; Trout and Shannon, 569; Wood, 633.

Blaine County.

Gypsum: Gould, 222, 225; Gould *et al.*, 253, 255, 256; Shannon, 481; Snider, 514.

Blaine County.—(Continued.)

- Oil and gas conditions: Snider, 513; Trout and Shannon, 569.
- Road materials: Snider, 505.
- Salt: Gould *et al.*, 253, 255; Snider, 514.
- Structural materials: Gould *et al.*, 256.
- Water supply: Gould, 228.
- Blaine formation: Clark, 113; Gordon, 208; Gould, 222, 228; Hutchison, 337; Snider, 504, 514; Willis, 619.
- Blue Creek faults: Taff, 552.
- Bluejacket coal: Siebenthal, 495.
- Boggy shale: Shannon and Trout, 482; Smith, 498; Snider, 504, 515; Taff, 541, 542, 543, 557; Taff and Adams, 562; Willis, 619.
- Bois d' Arc limestone: Reeds, 451; Shannon and Trout, 482; Wallis, 585.
- Bokchito formation: Larkin, 368; Nelson, 406; Shannon and Trout, 482; Taff, 542, 545; Taff and Reed, 563.
- Bokoche syncline: Smith, 498; Snider, 515; Taff and Adams, 562.
- Boone chert: Adams, 17; Adams *et al.*, 21; Hutchison, 337, 343; Nelson, 406; Purdue, 444; Schrader and Haworth, 471; Shannon and Trout, 482; Siebenthal, 495; Smith, 499; Snider, 505, 516, 517; Taff, 555, 557; Willis, 619.
- Paleontology*: Snider, 516, 517; Taff, 557.
- Boston Mountain plateau: Hershey, 295; Purdue, 444; Taff, 555, 557.
- Boston oil and gas pool: Trout and Shannon, 569.
- Boundaries of the United States: Gannett, 189.
- Boynton, coal: Siebenthal, 495.
- Boynton oil and gas pool: Trout and Shannon, 569.
- Brazil anticline: Severin, 478; Snider, 515; Taff and Adams, 562.
- Breccias: Siebenthal, 495.
- Brick: Gould *et al.*, 253, 255, 256; Shannon, 481; Snider, 504, 505.
- Broken Arrow oil and gas pool: Trout and Shannon, 569.

Bryan County.

- Asphalt: Hutchison, 343.
- Oil and gas conditions: Snider, 513; Trout and Shannon, 569.
- Road materials: Snider, 505.
- Structural materials: Gould *et al.*, 256.
- Building Stone.** *See also* Granite; Limestone; Sandstone; Stone.
- General*: Gould, 211, 221; Gould *et al.*, 256; Hutchison, 341; Schramm, 472, 473; Shannon, 481; Storm, 525.
- Arbuckle Mountains: Reeds, 450.
- Atoka quadrangle: Taff, 542.
- Muskogee quadrangle: Taff, 557.
- Northeastern Oklahoma: Siebenthal, 495.
- Tahlequah quadrangle: Taff, 555.
- Tishomingo quadrangle: Taff, 545.
- Burgen sandstone: Buttram, 100; Shannon, 481; Snider, 517; Taff, 555, 557.
- Buxton formation: Buttram, 102; Carpenter, 103; Nelson, 406; Ohern and Garrett, 419; Schrader and Haworth, 471; Shannon and Trout, 482; Siebenthal, 495; Snider, 504.
- Caddo County.**
- Gypsum: Clark, 113; Gould, 222, 225; Gould *et al.*, 253, 255, 256; Shannon, 481; Snider, 514.
- Oil and gas conditions: Snider, 513; Trout and Shannon, 569.
- Road materials: Snider, 505.
- Structural materials: Gould *et al.*, 256.
- Water supply: Gould, 228.
- Caddo limestone: Larkin, 368; Nelson, 406; Shannon and Trout, 482; Snider, 505; Taff, 542, 545; Taff and Reed, 563.
- Calamine: Snider, 509.
- Calcite: Snider, 509.
- California Creek oil and gas pool: Blatchley, 66; Snider, 513; Trout and Shannon, 569.
- Calvin sandstone: Shannon and Trout, 482; Taff, 541; Willis, 619.

Cambrian.*Stratigraphy.*

General: Taff, 553; Willis, 619.

Arbuckle Mountains: Gould, 228; Reeds, 450; Taff, 552.

Atoka quadrangle: Taff, 542.

Tishomingo quadrangle: Taff, 545.

Wichita Mountains: Taff, 552.

Paleontology.

Invertebrates: Taff, 552; Weller, 606.

Canadian anticline: Severin, 478.

Canadian County.

Gypsum: Gould, 222, 225; Gould *et al.*, 253, 255, 256; Shannon, 481; Snider, 514.

Oil and gas conditions: Snider, 513; Trout and Shannon, 569.

Road materials: Snider, 505.

Structural materials: Gould *et al.*, 256.

Water supply: Gould 228.

Canadian River: Gould, 220, 228; Kirk, 366; Matthews, 392; Sherwin, 487; Taff, 536, 542.

Canary oil and gas pool: Snider, 513; Trout and Shannon, 569.

Caney gas field: Blatchley, 66; Trout and Shannon, 569.

Caney shale: Girty, 201; Hutchison, 343; Nelson, 406; Shannon and Trout, 482; Siebenthal, 495; Snider, 504; Taff, 541, 542, 545, 552; Wallis, 585; Willis, 619; Woodworth, 635.

Paleontology: Eastman, 170; Girty, 201.

Carlton Mountain group: Taff, 552.

Carter County.

Asphalt: Hutchison, 343.

Mineral resources: Gould, 241.

Oil and gas conditions: Snider, 513; Trout and Shannon, 569.

Road materials: Snider, 505.

Structural materials: Gould *et al.*, 256.

Casing-head gas gasoline: Shannon, 481; Snider, 513.

Catoosa oil and gas pool: Trout and Shannon, 569.

Cavanal coal: Porter, 429; Shannon, 481; Taff, 543, 548, 554; Taff and Adams, 562.

Cavanal group: Taff, 543; Willis, 619.

Cavanal syncline: Smith, 498; Snider, 515; Taff and Adams, 562.

Cave Creek formation: Willis, 619.

Cedartop gypsum member: Clark, 113; Gould, 222, 228; Snider, 514; Willis, 619.

Cement. *See* Portland cement materials.

Cerussite: Snider, 509.

Chandler district: Gould, 228; Snider, 504.

Chaney gypsum member: Clark, 113; Gould, 222, 228; Snider, 514; Willis, 619.

Chapman dolomite: Willis, 619.

Chase formation: Hutchison, 337.

Chattanooga shale: Nelson, 406; Snider, 517; Taff, 555, 557; Willis, 619.

Chautauqua oil and gas pool: Snider, 513; Trout and Shannon, 569.

Checotah oil and gas pool: Trout and Shannon, 569.

Chelsea oil and gas pool: Hutchison, 343; Long, 374; Snider, 513; Trout and Shannon, 569.

Cherokee County.

Oil and gas conditions: Snider, 513; Trout and Shannon, 569.

Road materials: Snider, 505.

Structural materials: Gould *et al.*, 256.

Cherokee oil and gas pool: Hutchison, 343.

Cherokee Creek coal fields: Taff, 554.

Cherokee formation: Adams, 10; Garrett, 192; Nelson, 406; Ohern and Garrett, 419; Schrader and Hawthorth, 471; Shannon and Trout, 482; Siebenthal, 495; Smith, 499; Snider, 517; Willis, 619.

Chert: Snider, 509.

Chester group: Siebenthal, 495; Snider, 517.

Chickachoc chert lentil: Taff, 542.

Chicken Farm: Hutchison, 343; Trout and Shannon, 569.

Childers oil and gas pool: Hutchison, 343; Snider, 513; Trout and Shannon, 569.

Chimneyhill limestone: Reeds, 451; Shannon and Trout, 482; Wallis, 585.

Choctaw coal field: Chance, 111; Taff, 541, 554; Taff and Adams, 562.

Choctaw County.

Oil and gas conditions: Snider, 513; Trout and Shannon, 569.

Road materials: Snider, 505.

Structural materials: Gould *et al.*, 256.

Choctaw fault: Smith, 498; Taff, 541, 542; Taff and Adams, 562.

Cimarron County.

Oil and gas conditions: Snider, 513; Trout and Shannon, 569.

Road materials: Snider, 505.

Structural materials: Gould *et al.*, 256.

Cimarron River: Gould, 228.

Cimarron series: Prosser, 432; Willis, 619.

Cities and towns supplied with natural gas: Shannon, 481, 482.

Claggett oil and gas pool. *See* Nowata-Claggett.

Claremore formation: Gould *et al.*, 254; Ohern, 416; Snider, 504; Willis, 619.

Claremore oil and gas pool: Trout and Shannon, 569.

Clays: Gould, 221; Gould *et al.*, 253, 255, 256; Purdue, 444; Shannon, 481; Siebenthal, 495; Snider, 504, 505, 509; Taff, 541, 542, 545, 555, 557.

Analyses. *See under* Analyses.

Cleveland County.

Geology: Montgomery, 399.

Oil and gas conditions: Snider, 513; Trout and Shannon, 569.

Road materials: Snider, 505.

Structural materials: Gould *et al.*, 256.

Cleveland County.—(Continued).

Water supply: Gould, 228.

Cleveland oil and gas pool: Blatchley, 66; Hutchison, 343; Long, 374; Severin, 478; Snider, 513; Trout and Shannon, 569.

Climate: Gould, 228.

Coal.

General: Ashburner, 26; Drake, 167; Gould, 221, 237, 240; Gould *et al.*, 253, 255; Keyes, 353, 354; Lord, 376; Porter, 429; Purdue, 444; Reeds, 450; Shannon, 481; Siebenthal, 495; Taff, 541, 542, 546-550, 552, 554, 557; Taff and Adams, 562; Willis, 619.

Analyses. *See under* Analyses.

Companies, list of: Taff, 554.

Lands: Chance, 110; Drake, 167; Taff, 546-550, 554.

Mining: Crane, 140, 143; Taff, 554.

Coal County.

Oil and gas conditions: Snider, 513, 515; Taff and Adams, 562; Trout and Shannon, 569

Road materials: Snider, 505

Structural materials: Gould *et al.*, 256.

Coal measures faunal studies: Beede, 51; Beede and Rogers, 60, 61.

Coalgate anticline: Snider, 515; Taff, 541; Taff and Adams, 562.

Coalgate quadrangle: Taff, 541.

Coffeyville formation: Ohern and Garrett, 419; Schrader and Haworth, 471; Shannon and Trout, 482; Snider, 513.

Coke. *See* Coal.

Cole oil and gas pool: Trout and Shannon, 569.

Collingworth gypsum member: Gould, 222, 228; Snider, 514; Willis, 619.

Collinsville oil and gas pool: Blatchley, 66; Snider, 513; Trout and Shannon, 569.

Comanche County.

Gypsum: Clark, 113; Gould, 222, 225; Gould *et al.*, 253; Shannon, 481; Snider, 514.

Oil and gas conditions: Snider, 513; Trout and Shannon, 569.

Comanche County.—(Continued).

Structural materials: Gould *et al.*, 256.

Water supply: Gould, 228.

Comanche series: Gould, 221, 228; Hutchison, 337.

Concrete. *See* Portland cement materials.

Concretions, new forms: Nichols, 409.

Concretionary gypsum: Gould *et al.*, 256.

Conglomerate: Gould, 226.

Coody's Bluff oil and gas pool: Blatchley, 66; Hutchison, 343; Severin, 478; Snider, 513; Trout and Shannon, 569.

Co-operative work: Gould *et al.*, 255; Ohern, 418; Shannon, 481; Smith, 500.

Copan member: Ohern, 416; Snider, 504.

Copan oil and gas pool: Blatchley, 66; Snider, 513; Trout and Shannon, 569.

Copper: Fath, 175; Gould *et al.*, 253, 255; Haworth and Bennett, 276; Reeds, 450; Shannon, 481; Tarr, 565.

Cotton County.

Oil and gas conditions: Snider, 513; Trout and Shannon, 569.

Coweta oil and gas pool: Trout and Shannon, 569.

Cowlington syncline: Snider, 515.

Craig County.

Asphalt: Hutchison, 343.

Oil and gas conditions: Snider, 513; Trout and Shannon, 569.

Road materials: Snider, 505.

Structural materials: Gould *et al.*, 256.

Creek County.

Oil and gas conditions: Snider, 513; Trout and Shannon, 569.

Road materials: Snider, 505.

Structural materials: Gould *et al.*, 256.

Creek oil and gas field: Hutchison, 343.

Cretaceous.*Stratigraphy.*

General: Gould, 228; Hill, 301, 306, 308, 313, 319, 324; Hutchison, 343; Larkin, 368; Shannon and Trout, 482; Snider, 505, 513; Vaughan, 580; White, 615; Willis, 619.

Arbuckle Mountains: Taff, 552.

Atoka quadrangle: Taff, 542.

Tishomingo quadrangle: Taff, 545.

Western Oklahoma: Cragin, 132; Gould, 228; Hill, 320; Snider, 514.

Paleontology.

Invertebrates: Cragin, 132; Hill, 320, 321, 324; Larkin, 368; Vaughan, 580.

Plants: Hill, 320.

Vertebrates: Larkin, 369.

Criner Hills: Hutchison, 343; Taff, 552.

Curl formation: Ohern, 416; Snider, 504.

Cushing oil and gas field: Blatchley, 66; Buttram, 102; Snider, 513; Trout and Shannon, 569.

Custer County.

Gypsum: Clark, 113; Gould, 222, 225; Gould *et al.*, 253, 255, 256; Shannon, 481; Snider, 514.

Oil and gas conditions: Snider, 513; Trout and Shannon, 569.

Road materials: Snider, 505.

Structural materials: Gould *et al.*, 256.

Volcanic dust: Buttram, 101.

Water supply: Gould, 228.

Dakota Sandstone region: Gould, 228; Hutchison, 337.

Davis zinc field: Snider, 507.

Dawson coal: Siebenthal, 495; Taff, 554.

Day County.

Gypsum: Gould, 222, 225; Gould *et al.*, 253.

Water supply: Gould, 228.

Day Creek dolomite: Gould, 222, 228; Willis, 619.

Deep Red syncline: Munn, 401.

- Deep water wells. See Underground water.
- Delaware County.**
- Oil and gas conditions: Snider, 513; Trout and Shannon, 569.
- Road materials: Snider, 505.
- Structural materials: Gould *et al.*, 256.
- Delaware oil and gas pool: Hutchison, 343; Snider, 513; Trout and Shannon, 569.
- Delphi dolomite: Gould, 222.
- Devil's Canyon group: Snider, 505; Taff, 552.
- Devol anticline: Munn, 401.
- Devonian.**
- Stratigraphy.*
- General:* Willis, 619.
- Arbuckle Mountains: Reeds, 450; Taff, 552.
- Atoka quadrangle: Taff, 542.
- Northeastern Oklahoma: Sieben-
than, 495; Snider, 509, 517.
- Tahlequah quadrangle: Taff, 555.
- Tishomingo quadrangle: Taff, 545.
- Paleontology.*
- Invertebrates: Girty, 196; Hill, 341; Reeds, 451; Taff, 552.
- Plants: Taff, 552.
- Vertebrates: Taff, 555.
- Dewey County.**
- Gypsum: Clark, 113; Gould, 222, 225; Gould *et al.*, 253, 255, 256; Shannon, 481; Snider, 514.
- Oil and gas conditions: Snider, 513; Trout and Shannon, 569.
- Road materials: Snider, 505.
- Structural materials: Gould *et al.*, 256.
- Water supply: Gould, 228.
- Dewey limestone: Buttram, 102; Nelson, 406; Ohern, 416; Ohern and Garrett, 419; Shannon and Trout, 482; Snider, 505, 513; Wood, 632.
- Dewey oil and gas pool: Snider, 513; Trout and Shannon, 569.
- Diabase: Taff, 552; Taylor, 566.
- Dictionary of altitudes, United States: Gannett, 188.
- Dike rocks: Gould, 226; Snider, 505; Taylor, 566; Waldo, 584.
- Diorite: Taylor, 566.
- Distribution of Oklahoma minerals, map: O. G. S., 241.
- Dog Creek shales: Gould, 221, 228; Willis, 619.
- Dolomite: Snider, 509.
- Dougherty anticline: Eckes, 172; Edwards, 173.
- Doyle shale: Adams, 15; Ohern and Garrett, 419; Shannon and Trout, 482; Snider, 513; Willis, 619.
- Drainage: Gould, 242.
- Dropright dome: Buttram, 102.
- Dropright syncline: Buttram, 102.
- Drum limestone: Adams *et al.*, 20, 21; Hutchison, 337; Schrader and Haworth, 471; Severin, 478; Siebenthal, 495.
- Drumright dome: Buttram, 102.
- Drumright syncline: Buttram, 102.
- Duncan gas field: Hutchison, 343; Snider, 513; Wegemann, 605.
- Dune sand: Munn, 401.
- Eastern Choctaw coal field: Keyes, 353; Taff and Adams, 562.
- Eastern district: Snider, 505.
- Elgin sandstone: Buttram, 102; Carpenter, 103; Ohern and Garrett, 419; Schrader and Haworth, 471; Shannon and Trout, 482; Snider, 513.
- Ellis County.**
- Gypsum. Shannon, 481; Snider, 514.
- Oil and gas conditions: Snider, 513; Trout and Shannon, 569.
- Road materials: Snider, 505.
- Structural materials: Gould *et al.*, 256.
- Enid, native copper near: Haworth and Bennett, 276.
- Enid formation: Clark, 113; Gordon, 208; Gould, 228; Hutchison, 337; Low, 379; Snider, 504; Willis, 619.

Enterprise anticline: Snider, 515.

Eram district: Trout and Shannon, 569.

Experiments with windmills: Perry, 426.

Faults: Eckes, 172; Fath, 177; Larkin, 368; Siebenthal, 495; Smith, 498; Snider, 515; Taff, 542, 545, 555, 557; Taff and Adams, 562; Taff and Reed, 563.

Fayetteville formation: Adams, 17; Hutchison, 337, 343; Nelson, 406; Purdue, 444; Shannon and Trout, 482; Smith, 499; Snider, 516, 517; Taff, 555, 557; Willis, 619.

Palaeontology: Snider, 516, 517; Taff, 559.

Ferguson gypsum member: Clark, 113; Gould, 222, 228; Hutchison, 337; Willis, 619.

Fern Mountain oil and gas pool: Trout and Shannon, 569.

Flint Hills region: Beede, 59; Gould, 220, 228; Hutchison, 337, 343; Nelson, 406.

Florence flint: Adams *et al.*, 20; Willis, 619.

Flowerpot shales: Willis, 619.

Folds: Eckes, 172; Purdue, 445; Siebenthal, 495; Smith, 498; Taff, 545, 555, 557; Taff and Adams, 562.

Foraker formation: Carpenter, 103.

Fort Reno well: Gould, 228.

Fort Riley limestone: Adams *et al.*, 20; Gordon, 208; Ohern and Garrett, 419; Shannon and Trout, 482; Snider, 513; Willis, 619.

Fort Scott coal: Adams, 10; Siebenthal, 495.

Fort Scott formation: Adams *et al.*, 20, 21; Hutchison, 337; Nelson, 406; Severin, 478; Shannon and Trout, 482; Siebenthal, 495; Smith, 499; Snider, 513.

Fort Smith-Poteau gas field: Smith, 498.

Franks conglomerate: Hutchison, 343; Reeds, 450; Shannon and Trout, 482; Snider, 505, 513; Taff, 545, 552; Wallis, 585; Willis, 619.

French oil and gas pool: Trout and Shannon, 569.

Gabbro: Gould, 226, 228; Snider, 505; Taff, 552; Taylor, 566.

Galena. *See* Lead.

Garfield County.

Geology: Adams, 6.

Oil and gas conditions: Snider, 513; Trout and Shannon, 569.

Structural materials: Gould *et al.*, 256.

Water supply: Gould, 228.

Garvin County.

Asphalt: Hutchison, 343.

Oil and gas conditions: Snider, 513; Trout and Shannon, 569.

Road materials: Snider, 505.

Structural materials: Gould *et al.*, 256.

Gas pipe lines: Buttram, 102; Shannon, 481, 482; Snider, 513.

Geology and water resources: Gould, 228.

Gilmore anticline: Snider, 515.

Glass: Buttram, 101; Gould *et al.*, 256; Hutchison, 340; Shannon, 481.

Glass Mountain: Gordon, 208; White, 615.

Glass Mountain formation: Gould, 220; Willis, 619.

Glass sand: Buttram, 99, 100; Gould *et al.*, 253, 255; Reeds, 450; Shannon, 481.

Analyses. *See under* Analyses.

Glenn formation: Hutchison, 343; Reeds, 450; Shannon and Trout, 482; Snider, 504; Taff, 545, 552; Wallis, 585; Willis, 619.

Glenn oil and gas pool: Blatchley, 66; Hutchison, 343; Severin, 478; Siebenthal, 495; Smith, 499; Trout and Shannon, 569.

Gold: Bain, 36, 37, 38; Gould *et al.*, 253, 255; Hutchison, 343; Shannon, 481; Taff, 552.

Goodland limestone: Larkin, 368; Nelson, 406; Shannon and Trout, 482; Snider, 505, 513; Taff, 542, 545; Taff and Reed, 563; Willis, 619.

Gotebo oil and gas pool: Hutchison, 343; Snider, 513; Trout and Shannon, 569.

Grady coal: Willis, 619.

Grady County.

Coal: *See* Grady coal.

Gypsum: Shannon, 481; Snider, 514.

Oil and gas conditions: Snider, 513; Trout and Shannon, 569.

Road materials: Snider, 505.

Structural materials: Gould *et al.*, 256.

Grahamite. *See* Asphalt.

Grandfield district: Munn, 401.

Granite.

General: Shannon, 481.

Arbuckle mountains: Gould *et al.*, 253, 255, 256; Reeds, 450; Shannon and Trout, 482; Snider, 505; Taff, 545, 552; Taylor, 566.

Spavinaw Creek: Gould *et al.*, 253, 255, 256; Taylor, 566.

Wichita Mountains: Gould, 226, 228; Gould *et al.*, 253, 255, 256; Snider, 505; Taff, 552; Taylor, 566.

Granite gravel: Snider, 505.

Granite oil field: Hutchison, 343; Snider, 513; Trout and Shannon, 569.

Granite porphyry: Gould, 226, 228; Snider, 505; Taff, 552.

Granite sulphur spring: Gould, 228.

Grant County.

Geology: Adams, 6.

Oil and gas conditions: Snider, 513; Trout and Shannon, 569.

Road materials: Snider, 505.

Structural materials: Gould *et al.*, 256.

Water supply: Gould, 228.

Gravel: . Gould *et al.*, 253, 255; Munn, 401; Reeds, 450; Shannon, 481; Snider, 505.

Greenockite: Snider, 509.

Greer County.

Gypsum: Clark, 113; Gould, 222, 225; Gould *et al.*, 253, 255, 256; Shannon, 481; Snider, 514.

Oil and gas conditions: Snider, 513; Trout and Shannon, 569.

Road materials: Snider, 505.

Salt: Gould *et al.*, 253.

Structural materials: Gould *et al.*, 256.

Water supply: Gould, 228.

Greer formation: Clark, 113; Gould, 222, 228; Matthews, 392; Snider, 504, 514; Willis, 619.

Grorudite: Taff, 552.

Guano deposits: Barnes, 42.

Gueda salt measures: Gould, 228.

Guertie sand: Taff, 541.

Gypsite. *See* Gypsum.

Gypsum. *See also under names of Counties.*

General: Clark, 113; Gould, 219, 222, 225, 228, 235; Gould *et al.*, 253, 255, 256; Shannon, 481; Sherwin, 485, 487; Snider, 511, 514.

Analyses. *See under* Analyses.

Hackberry shales: Gould, 228.

Hale formation: Purdue, 444.

Hamilton formation: Purdue, 444.

Hamilton Switch oil and gas pool: Snider, 513; Trout and Shannon, 569.

Haragan shale: Reeds, 451; Shannon and Trout, 482; Wallis, 585.

Harmon County.

Gypsum: Clark, 113; Gould *et al.*, 255, 256; Shannon, 481; Snider, 514.

Oil and gas conditions: Snider, 513; Trout and Shannon, 569.

Road materials: Snider, 505.

Salt: Gould *et al.*, 255; Snider, 514.

Structural materials: Gould *et al.*, 256.

Harper County.

Gypsum: Gould *et al.*, 255, 256; Shannon, 481; Snider, 514.

Oil and gas conditions: Snider, 513; Trout and Shannon, 569.

Harper County.—(Continued).

Road materials: Snider, 505.

Structural materials: Gould *et al.*, 256.

Harper sandstone: Willis, 619.

Hartford anticline: Smith, 498; Snider, 515.

Hartshorne coal: Porter, 429; Shannon, 481; Taff, 541, 542, 543, 546, 548, 554; Taff and Adams, 562; Willis, 619.

Hartshorne, local faulting near: Snider, 515; Taff and Adams, 562.

Hartshorne sandstone: Shannon and Trout, 482; Smith, 499; Snider, 515; Taff, 541, 542, 543; Taff and Adams, 562; Willis, 619.

Haskell County.

Oil and gas conditions: Snider, 513; Trout and Shannon, 569.

Road materials: Snider, 505.

Structural materials: Gould *et al.*, 256.

Volcanic dust: Buttram, 101.

Haskell oil and gas field: Trout and Shannon, 569.

Haystack gypsum member: Clark, 113; Gould, 222, 228; Snider, 514; Willis, 619.

Headquarter Mountain group: Taff, 552.

Healdton oil and gas field: Trout and Shannon, 569.

Heavener anticline: Smith, 498; Snider, 515; Taff and Adams, 562.

Henryetta coal: Shannon, 481; Sieben-thal, 495; Taff, 554.

Henryetta oil and gas field: Blatchley, 66; Hutchison, 343; Snider, 513; Trout and Shannon, 569.

Henryhouse shale: Reeds, 451; Shannon and Trout, 482; Wallis, 585.

Herrington limestone: Ohern and Garrett, 419; Shannon and Trout, 482.

Hichita oil and gas field: Trout and Shannon, 569.

High Plains Region. (Included under Redbeds Region). *See also* Tertiary.

Hobart oil field: Trout and Shannon, 569.

Hoffman oil and gas field: Trout and Shannon, 569.

Hogshooter limestone: Ohern, 416; Ohern and Garrett, 419; Shannon and Trout, 482; Snider, 505; Wood, 632.

Hogshooter oil and gas pool: Blatchley, 66; Snider, 513; Trout and Shannon, 569.

Holdenville shale: Shannon and Trout, 482; Snider, 504; Taff, 541; Willis, 619.

Hominy district: Gould, 228.

Hominy gas field: Snider, 513; Trout and Shannon, 569.

Howe anticline: Severin, 478; Snider, 515.

Howe-Poteau district, segregated coal lands: Taff, 548.

Hughes County.

Oil and gas conditions: Snider, 513; Trout and Shannon, 569.

Road materials: Snider, 505.

Structural materials: Gould *et al.*, 256.

Volcanic dust: Buttram, 101.

Hunton anticline: Taff, 542, 545, 552.

Hunton formation: Eckel, 171; Eckes, 172; Girty, 201; Hutchison, 343; Nelson, 406; Reeds, 451; Shannon and Trout, 482; Snider, 505; Taff, 542, 545, 552, 553; Taff and Reed, 563; Willis, 619.

Paleontology: Reeds, 451; Taff, 545.

Hydrozincite. *See* Zinc.

Igneous rocks. *See also* Pre-Cambrian.

General: Eckes, 172; Gould, 221; Hutchison, 343; Snider, 505, 517; Taff, 542, 545, 552.

Arbuckle Mountains, Eckes, 172; Hutchison, 343; Snider, 505;

Ouachita Mountains: Hutchison, 343; Taff, 552.

Spavinaw Creek: Drake, 167; Gould, 221; Hutchison, 343; Snider, 517.

Wichita Mountains: Taff, 552; Taylor, 566.

Inola oil and gas development: Trout and Shannon, 569.

Iron: Gould *et al.*, 253, 255; Reeds, 450, Shannon, 481.

Irrigation: Gould, 228; Hood, 333; Schwennessen, 474, 475; Wilson, 625.

Jackfork sandstone: Girty, 201; Hutchison, 343; Shannon and Trout, 482; Taff, 542, 558; Wallis, 585; Willis, 619.

Jackson County.

Gypsum: Gould *et al.*, 255, 256; Shannon, 481; Snider, 514.

Oil and gas conditions: Snider, 513; Trout and Shannon, 569.

Road materials: Snider, 505.

Salt: Snider, 514.

Structural materials: Gould *et al.*, 256.

Jefferson County.

Asphalt: Hutchison, 343.

Oil and gas conditions: Snider, 513; Trout and Shannon, 569.

Road materials: Snider, 505.

Structural materials: Gould *et al.*, 256.

Jenkins clays: Willis, 619.

Jenks oil and gas pool: Trout and Shannon, 569.

Johnston County.

Asphalt: Hutchison, 343.

Oil and gas conditions: Snider, 513; Trout and Shannon, 569.

Road materials: Snider, 505.

Structural materials: Gould *et al.*, 256.

Jones Creek coal: Taff, 551.

Kanima anticline: Snider, 515.

Kay County.

Gypsum: Clark, 113; Gould, 222, 225; Gould *et al.*, 253, 255, 256; Shannon, 481; Snider, 514.

Oil and gas conditions: Hutchison, 343; Snider, 513; Trout and Shannon, 569.

Road materials: Snider, 505.

Structural materials: Gould *et al.*, 256.

Water supply: Gould, 228.

Kerosene. *See* Petroleum.

Kiamichi formation: Larkin, 368; Nelson, 406; Shannon and Trout, 482; Snider, 513; Taff, 542, 545; Taff and Reed, 563.

Kiamichi Mountain: Taff, 542, 558.

Kiefer oil and gas pool: Trout and Shannon, 569.

Kiger division: Gould, 228.

Kingfisher County.

Gypsum: Gould, 222, 225; Gould *et al.*, 253, 255, 256; Shannon, 481; Snider, 514.

Oil and gas conditions: Snider, 513; Trout and Shannon, 569.

Road materials: Snider, 505.

Structural materials: Gould *et al.*, 256.

Water supply: Gould, 228.

Kingfisher formation: Willis, 619.

Kingfisher well: Gould, 228.

Kinta anticline: Snider, 515.

Kinta oil and gas development: Snider, 513.

Kiowa County.

Oil and gas conditions: Snider, 513; Trout and Shannon, 569.

Road materials: Snider, 505.

Structural materials: Gould *et al.*, 256.

Water supply: Gould, 228.

Kiowa syncline: Snider, 515; Taff, 541; Taff and Adams, 562.

Kiser gypsum member: Clark, 113; Gould, 222, 228; Snider, 514; Willis, 619.

Krebs syncline: Snider, 515; Taff and Adams, 562.

Labette shale: Adams *et al.*, 20, 21; Hutchison, 343; Nelson, 406; Ohern and Garrett, 419; Schradler and Haworth, 471; Severin, 478; Shannon and Trout, 482; Siebenthal, 495; Snider, 504.

Latimer County.

Oil and gas conditions: Trout and Shannon, 569.

Road materials: Snider, 505.

Structural materials: Gould *et al.*, 256.

Lauderdale oil and gas pool: Snider, 513; Trout and Shannon, 569.

Lawton oil and gas field: Hutchison, 343; Snider, 513; Trout and Shannon, 569; Wegemann, 603.

Layton sand: Buttram, 102.

Lead: Bain, 32; Cross, 147; Gould *et al.*, 253, 255; Purdue, 444; Reeds, 450; Shannon, 481; Siebenthal, 495; Snider, 508, 509, 517.

Leflore County.

Asphalt: Hutchison, 343

Oil and gas conditions: Snider, 513; Trout and Shannon, 569.

Road materials: Snider, 505.

Structural materials: Gould *et al.*, 256.

Lehigh basin: Snider, 515; Taff, 541; Taff and Adams, 562.

Lehigh coal: Taff, 541, 542, 550.

Lehigh-Ardmore district, segregated coal lands: Taff, 550.

Lenapah limestone: Gould *et al.*, 254; Nelson, 406; Ohern, 416; Ohern and Garrett, 419; Shannon and Trout, 482; Snider, 505; Willis, 619.

Leonard oil and gas pool: Trout and Shannon, 569.

Lightening Creek oil and gas development: Trout and Shannon, 569.

Lime: Gould *et al.*, 256; Shannon, 481; Taff, 542.

Limestone: Gould, 216; Gould *et al.*, 253, 255, 256; Shannon, 481; Snider, 505, 506, 509; Taff, 541, 542, 545, 555, 557.

Limestone Ridge: Taff, 541; Wallis, 585.

Limestone springs: Gould, 228.

Lincoln County.

Oil and gas conditions: Snider, 513; Trout and Shannon, 569.

Road materials: Snider, 505.

Structural materials: Gould *et al.*, 256.

Water supply: Gould, 228.

Loco oil and gas field: Hutchison, 343; Snider, 513; Trout and Shannon, 569; Wegemann, 604.

Logan County.

Oil and gas conditions: Snider, 513; Trout and Shannon, 569.

Road materials: Snider, 505.

Structural materials: Gould *et al.*, 256.

Lost City limestone: Smith, 499.

Lost City oil and gas field: Trout and Shannon, 569.

Love County.

Asphalt: Hutchison, 343.

Oil and gas conditions: Snider, 513; Trout and Shannon, 569.

Road materials: Snider, 505.

Structural materials: Gould *et al.*, 256.

McAlester anticline: Severin, 478; Snider, 515; Taff and Adams, 562.

McAlester coals: Brown, 92; Porter, 429; Shannon, 481; Taff, 543, 546, 554; Taff and Adams, 562.

McAlester district, segregated coal lands: Taff, 546.

McAlester-Lehigh coal fields: Snider, 515; Taff, 537, 546; Taff and Adams, 562.

McAlester shale: Shannon and Trout, 482; Smith, 498; Snider, 504, 515; Taff, 541, 542, 543, 554; Taff and Adams, 562; Willis, 619.

McCann sandstone: Gould, 220.

McClain County.

Oil and gas conditions: Snider, 513; Trout and Shannon, 569.

Road materials: Snider, 505.

Structural materials: Gould *et al.*, 256.

McCurtain anticline: Severin, 478.

McCurtain County.

Asphalt: Hutchison, 343.

Oil and gas conditions: Snider, 513; Trout and Shannon, 569.

Road materials: Snider, 505.

Structural materials: Gould *et al.*, 256.

McCurtain-Massey district, segregated coal lands: Taff, 549.

McIntosh County.

Oil and gas conditions: Snider, 513; Trout and Shannon, 569.

McIntosh County.—(Continued).

Road materials: Snider, 505.

Structural materials: Gould *et al.*, 256.

Madill oil and gas pool: Hutchison, 343; Snider, 513; Taff and Reed, 563; Trout and Shannon, 569.

Magpie dolomite: Gould, 222.

Major County.

Gypsum: Clark, 113; Gould *et al.*, 255, 256; Shannon, 481; Snider, 514.

Oil and gas conditions: Snider, 513; Trout and Shannon, 569.

Road materials: Snider, 505.

Structural materials: Gould *et al.*, 256.

Manganese: Reeds, 450; Weeks, 587.

Mangum dolomite member: Gould, 228; Willis, 619.

Mannford oil and gas development: Trout and Shannon, 569.

Mannsville, oil and gas development near: Trout and Shannon, 569.

Marble: Gould *et al.*, 253, 255, 256; Shannon, 481.

Marcasite. *See* Lead.

Marion formation: Adams *et al.*, 20; Clark, 113; Gould, 220; Hutchison, 337; Snider, 513; Trout and Shannon, 569; Willis, 619.

Marshall County.

Asphalt: Hutchison, 343.

Oil and gas conditions: Trout and Shannon, 569.

Portland cement rock: Hutchison, 338.

Road materials: Snider, 505.

Structural materials: Gould *et al.*, 256.

Massard Prairie anticline: Smith, 498.

Matfield shale: Adams *et al.*, 20; Ohern and Garrett, 419; Shannon and Trout, 482; Snider, 513; Willis, 619.

Mayes County.

Oil and gas conditions: Snider, 513; Trout and Shannon, 569.

Road materials: Snider, 505.

Mayes County.—(Continued).

Structural materials: Gould *et al.*, 256.

Mayes formation: Snider, 517.

Medicine Lodge gypsum member: Clark, 113; Gould, 222, 228; Hutchison, 337; Willis, 619.

Metamorphic rocks.

General: Snider, 505.

Ouachita Mountains: Hutchison, 343.

Wichita Mountains: Taylor, 566.

Miami lead and zinc district: Chapman, 112; Ruhl, 463; Snider, 509.

Mid-continent oil and gas field: Gould, 251; Hutchison, 339, 343; Lakes, 367; Shannon, 481; Snider, 513.

Waste of oil and gas: Blatchley, 66.

Mill Creek anticline: Smith, 498; Snider, 515; Taff, 549; Taff and Adams, 562.

Mineral oils. *See* Petroleum.

Mineral exhibit, State Fair: Gould *et al.*, 255; Shannon, 481.

Mineral resources. *See* Economic geology under names of *Physiographic Provinces*.

Mineral water: Shannon, 481.

Mississippian.*Stratigraphy.*

General: Adams, 10; Hutchison, 343; Severin, 478; Shannon and Trout, 482; Snider, 504, 505, 513; Willis, 619.

Arbuckle Mountains: Girty, 201; Taff, 552.

Glenn oil and gas pool: Smith, 499.

Muskogee quadrangle: Taff, 557.

Northeastern Oklahoma: Drake, 167; Siebenthal, 495; Snider, 509; 516, 517.

Southeastern Oklahoma: Girty, 201; Purdue, 446.

Tahlequah quadrangle: Taff, 555.

Tishomingo quadrangle: Taff, 545.

Paleontology.

Invertebrates: Drake, 167; Girty, 201; Snider, 509, 516, 517; Taff, 552, 555.

Plants: Girty, 201.

Moorefield shale: Girty, 201.

Morrow formation: Adams, 17; Nelson, 406; Smith, 499; Snider, 517; Taff, 555, 557; Willis, 619.

Morris oil and gas pool: Blatchley, 66; Snider, 513; Trout and Shannon, 569.

Mounds oil and gas pool: Trout and Shannon, 569.

Mount Pleasant dome: Buttram, 102.

Murray County.

Asphalt: Hutchison, 343.

Oil and gas conditions: Snider, 513; Trout and Shannon, 569.

Road materials: Snider, 505.

Structural materials: Gould *et al.*, 256.

Muskogee County.

Oil and gas conditions: Snider, 513; Trout and Shannon, 569.

Road materials: Snider, 505.

Structural materials: Gould *et al.*, 256.

Muskogee group: Gould *et al.*, 254; Hutchison, 343; Ohern, 416; Snider, 504, 505; Willis, 619.

Muskogee oil and gas field: Blatchley, 66; Hutchison, 343; Long, 374; Severin, 478; Snider, 513; Taff and Shaler, 564; Trout and Shannon, 569.

Muskogee quadrangle: Taff, 557.

Native copper. *See* Enid.

Natural gas.

General: Adams, 10; Blatchley, 66; Broadhead, 81; Buttram, 102; Gould, 221, 228, 232, 236; Gould *et al.*, 253; Hutchison, 343; Perry and Hutchison, 427; Severin, 478; Shannon, 481; Shannon and Trout, 482; Siebenthal, 495; Snider, 513; Wood, 633.

Analyses. *See under* Analyses.

Fields.

Classification: Snider, 513; Trout and Shannon, 569.

List of: Shannon, 481.

Present condition of: Blatchley, 66.

Movements of: Buttram, 102; Hutchison, 343; Snider, 513.

Nelagony oil and gas pool: Trout and Shannon, 569.

Neosho river, geologic section: Haworth and Kirk, 279.

Neva limestone: Adams *et al.*, 20; Beede, 59; Thompson, 567; Willis, 619.

New limestone in Indian Territory: Condra, 121.

Newkirk gas field: Hutchison, 343; Long, 374; Snider, 513; Trout and Shannon, 569.

Noble County.

Oil and gas conditions: Snider, 513; Trout and Shannon, 569.

Road materials: Snider, 505.

Structural materials: Gould *et al.*, 256.

Water supply: Gould, 228.

Non-red Permian rocks: Snider, 504, 513; Trout and Shannon, 569.

Norman division: Gould, 228.

North-central Oklahoma: Wood, 633.

Novaculite: Gould *et al.*, 253, 255; Shannon, 481.

Nowata County.

Oil and gas conditions: Snider, 513; Trout and Shannon, 569.

Road materials: Snider, 505.

Structural materials: Gould *et al.*, 256.

Nowata-Claggett oil and gas pool: Snider, 513; Trout and Shannon, 569.

Nowata quadrangle: Wood, 632.

Nowata shale: Hutchison, 337; Nelson, 406; Ohern, 416; Ohern and Garrett, 419; Severin, 478; Shannon and Trout, 482; Snider, 504.

Ochelata limestone: Nelson, 406; Wood, 632.

Ochelata oil and gas prospects. Trout and Shannon, 569.

Oil-bearing rock: Snider, 513.

Oil. *See* Petroleum.

Oil fields. *See* Petroleum.

Oil and gas conditions. *See under names of Counties.*

Okfuskee County.

Oil and gas conditions: Snider, 513; Trout and Shannon, 569.

Road materials: Snider, 505.

Structural materials: Gould *et al.*, 256.

Oklahoma County.

Oil and gas conditions: Snider, 513; Trout and Shannon, 569.

Road materials: Snider, 505.

Structural materials: Gould *et al.*, 256.

Water supply: Gould, 228.

Okmulgee County.

Oil and gas conditions: Snider, 513; Trout and Shannon, 569.

Road materials: Snider, 505.

Structural materials: Gould *et al.*, 256.

Okmulgee oil and gas field: Snider, 513; Trout and Shannon, 569.

Oolitic limestone. *See* Limestone.

Oolagah formation: Adams *et al.*, 20; Hutchison, 337; Ohern, 416; Reeds, 448; Severin, 478; Snider, 504, 513; Trout and Shannon, 569.

Oolagah oil and gas development: Trout and Shannon, 569.

Opening of Indian Territory: Condra, 122.

Optima well: Gould, 228.

Ordovician.*Stratigraphy.*

General: Hutchison, 343; Gould, 228; Snider, 505, 509; Taff, 553; Willis, 619.

Arbuckle Mountains: Reeds, 450; Taff, 552.

Atoka quadrangle: Taff, 542.

Northeastern Oklahoma: Drake, 167; Siebenthal, 495; Snider, 509, 517.

Southeastern Oklahoma: Hutchison, 343; Purdue, 445, 446, 447; Taff, 558.

Tahlequah quadrangle: Taff, 555.

Tishomingo quadrangle: Taff, 545.

Wichita Mountains: Taff, 552.

*Palaeontology.***Ordovician.—(Continued).**

Invertebrates: Girty, 196; Snider, 517; Taff, 552, 555; Trout, 568; Weller, 606.

Oread limestone: Adams *et al.*, 20; Buttram, 102; Carpenter, 103; Ohern and Garrett, 419; Shannon and Trout, 482; Snider, 513.

Osage County.

Formations outcropping: Buttram, 102.

Oil and gas conditions: Hutchison, 343; Snider, 513; Trout and Shannon, 569.

Road materials: Snider, 505.

Structural materials: Gould *et al.*, 256.

Water supply: Gould, 228.

Osage oil and gas field: Blatchley, 66; Snider, 513; Trout and Shannon, 569.

Osage Nation, leasing for oil and gas: Hutchison, 343; Snider, 513; Trout and Shannon, 569.

Oswego lime. *See* Fort Scott formation.

Otoe anticline: Trout and Shannon, 569.

Ottawa County.

Asphalt: Hutchison, 343.

Oil and gas conditions: Snider, 513; Trout and Shannon, 569.

Road materials: Snider, 505.

Structural materials: Gould *et al.*, 256.

Ouachita Mountain Region.

General geology: Hill, 314; Hutchison, 343; Purdue, 445, 446, 447; Shannon and Trout, 482; Snider, 504, 505, 513; Taff, 539, 540, 542; Wallis, 585; Willis, 619.

Economic geology: Hutchison, 343; Shannon and Trout, 482; Snider, 504, 505, 509, 513; Taff, 558.

Igneous rocks: Hutchison, 343.

Palaeontology: Girty, 201.

Owasso, oil and gas development: Blatchley, 66; Trout and Shannon, 569.

Ozark Mountain Region.

General geology: Broadhead, 87, 88, 90; Drake, 167; Purdue, 444; Siebenthal, 495; Snider, 509, 516, 517; Taff, 555, 557; Wallis, 585; Willis, 619.

Economic geology: Bain, 32; Gould, 238; Gould *et al.*, 253, 255, 256; Purdue, 444; Siebenthal, 495; Snider, 508, 509, 517; Taff, 555, 557.

Igneous rocks: Drake, 167; Siebenthal, 495; Snider, 517.

Paleontology: Drake, 167; Snider, 516, 517; Taff, 555, 557.

Paden, faulted structure near: Fath, 177.

Paleontology.

General: Reeds, 449.

Cambrian.

Invertebrates: Taff, 552.

Ordovician.

Invertebrates: Girty, 196; Snider, 517; Taff, 552, 555; Trout, 568.

Silurian.

Invertebrates: Girty, 196; Reeds, 451; Snider, 517; Taff, 552, 555.

Devonian.

Invertebrates: Girty, 196; Hill, 341; Reeds, 451; Taff, 552.

Plants: Taff, 552.

Vertebrates: Taff, 555.

Mississippian.

Invertebrates: Drake, 167; Girty, 201; Snider, 509, 516, 517; Taff, 552, 555.

Plants: Girty, 201.

Pennsylvanian.

Invertebrates: Adams *et al.*, 20; Beede, 46, 51, 53, 60, 61; Drake, 167; Girty, 196, 199, 203, 204.

Plants: Adams *et al.*, 20; White, 612.

Permian.

Invertebrates: Beede, 47, 48, 49, 52, 53, 54, 56; Gould, 214.

Vertebrates: Case, 104, 106, 108; Williston, 624.

Cretaceous.

Invertebrates: Cragin, 132; Hill, 320, 321, 324; Larkin, 368.

Paleontology.—(Continued).

Plants: Hill, 320.

Vertebrates: Larkin, 369.

Panama coal: Taff, 551.

Parsons formation: Adams *et al.*, 20, 21; Hutchison, 337; Schrader, 471; Severin, 478; Siebenthal, 495.

Pavements. *See also* Roads.

Asphalt: Hutchison, 343; Snider, 505, 510.

Cobblestone, stone block and wood block; Snider, 505.

Pawhuska limestone: Adams *et al.*, 20; Buttram, 102; Carpenter, 103; Gould *et al.*, 254; Hutchison, 337; Nelson, 406; Willis, 619.

Pawhuska quadrangle: Carpenter, 103.

Pawnee County.

Oil and gas conditions: Hutchison, 343; Snider, 513; Trout and Shannon, 569.

Road materials: Snider, 505.

Structural materials: Gould *et al.*, 256.

Water supply: Gould, 228.

Pawnee limestone: Adams *et al.*, 20, 21; Nelson, 406; Ohern and Garrett, 419; Reeds, 448; Schrader and Haworth, 471; Shannon and Trout, 482; Siebenthal, 495; Snider, 513.

Payne County.

Oil and gas conditions: Snider, 513; Trout and Shannon, 569.

Road materials: Snider, 505.

Structural materials: Gould *et al.*, 256.

Water supply: Gould, 228.

Payne sandstone: Willis, 619.

Pennsylvanian.

Stratigraphy.

General: Adams, 12; Beede, 56, 57; Gould, 228; Gould *et al.*, 256; Hutchison, 343; Kirk, 365; Severin, 478; Shannon and Trout, 482; Snider, 504, 505, 513; Stevenson, 524; Willis, 619.

Arbuckle Mountains: Taff, 552.

East-central Oklahoma: Smith, 498; Snider, 515; Taff, 537; Taff and Adams, 562.

Pennsylvanian.—(Continued).

Glenn oil and gas pool: Smith, 499.
 Grandfield district: Munn, 401.
 Muskogee quadrangle: Taff, 557.
 North-central Oklahoma: Adams, 6; Beede, 59; Ohern and Garrett, 419; Wood, 633.
 North-eastern Oklahoma: Ohern, 416; Siebenthal, 495; Snider, 517.
 Nowata quadrangle: Wood, 632.
 Tahlequah quadrangle: Taff, 555.
 Tishomingo quadrangle: Taff, 545.
 Wichita Mountains: Taff, 552.

Paleontology.

Invertebrates: Adams *et al.*, 20; Beede, 46, 51, 53, 60, 61; Drake, 167; Girty, 196, 199, 203, 204.
 Plants: Adams *et al.*, 20; White, 612.

Permian.*Stratigraphy.*

General: Adams, 6, 9, 12, 13, 16; Beede, 48, 56, 57, 58, 59; Cragin, 136; Gould, 214, 220, 221, 222, 228, 250; Gould *et al.*, 256; Snider, 514; Willis, 619.
 Arbuckle Mountains: Taff, 552.
 Grandfield district: Munn, 401.
 Undifferentiated: Gould, 228; Shannon and Trout, 482.
 Wichita Mountains: Taff, 552.

Paleontology.

Invertebrates: Beede, 47, 48, 49, 52, 53, 54, 56; Gould, 214.
 Vertebrates: Case, 104, 106, 108; Williston, 624.

Petroleum.

General: Adams, 10; Blatchley, 66; Broadhead, 81; Buttram, 102; Gould, 221, 228, 236, 249; Gould *et al.*, 253, 255; Hutchison, 343; Perry and Hutchison, 427; Severin, 478; Shannon, 481; Shannon and Trout, 482; Siebenthal, 495; Smith, 499; Snider, 513; Taff, 559; Taff and Reed, 563; Wood, 633.

Analyses. *See under* Analyses.
 Fields.

Classification: Snider, 513; Trout and Shannon, 569.

List of: Shannon, 481.

Petroleum.—(Continued).

Present condition: Blatchley, 66.
 Phosphate: Reeds, 450.
 Physiographic map: O. G. S., 422.
 Physiographic types: Gannett, 190.
 Pine oil and gas pool: Trout and Shannon, 569.
 Pipe lines: Hutchison, 343; Shannon, 481; Shannon and Trout, 482; Snider, 513.
 Pitkin limestone: Hutchison, 337, 343; Nelson, 406; Shannon and Trout, 482; Smith, 499; Snider, 505, 516, 517; Taff, 555, 557.

Paleontology: Snider, 516, 517.

Pittsburg County.

Oil and gas conditions: Snider, 513; Trout and Shannon, 569.

Road materials: Snider, 505.

Structural materials: Gould *et al.*, 256.

Plains: Gould, 228; Snider, 514; Taff, 541.

Pleistocene gravels: Taff, 541, 545, 555.

Ponca City oil and gas field: Blatchley, 66; Hutchison, 343; Ohern and Garrett, 419; Snider, 513; Trout and Shannon, 569.

Pontotoc County.

Asphalt: Hutchison, 343.

Oil and gas conditions: Snider, 513; Trout and Shannon, 569.

Road materials: Snider, 505.

Structural materials: Gould *et al.*, 256.

Porter oil and gas development: Trout and Shannon, 569.

Portland cement materials: Eckel, 171; Gould *et al.*, 255, 256; Hutchison, 342; Nelson, 406; Reeds, 450; Shannon, 481; Siebenthal, 495; Taff, 553.

Analyses. *See under* Analyses.

Porum syncline: Snider, 515.

Poteau anticline: Smith, 498; Snider, 515.

Poteau oil and gas field: Blatchley, 66; Snider, 513, 515; Taff and Adams, 562; Trout and Shannon, 569.

Poteau syncline: Smith, 498; Snider, 515; Taff and Adams, 562; Trout and Shannon, 569.

Pottawatomie County.

Oil and gas conditions: Snider, 513; Trout and Shannon, 569.

Road materials: Snider, 505.

Structural materials: Gould *et al.*, 256.

Water supply: Gould, 228.

Pre-Cambrian.

General: Willis, 619.

Arbuckle Mountains: Gould *et al.*, 256; Reeds, 450; Shannon and Trout, 482; Snider, 504, 509; Taff, 552; Taylor, 566.

Atoka quadrangle: Taff, 542.

Tishomingo quadrangle: Taff, 545.

Wichita Mountains: Gould *et al.*, 256; Shannon and Trout, 482; Snider, 509; Taff, 552; Taylor, 566.

Preston oil and gas field: Hutchison, 343; Snider, 513; Trout and Shannon, 569.

Progress geologic map: O. G. S., 421.

Progress of coal work: Taff, 554.

Pushmataha County.

Oil and gas conditions: Snider, 513; Trout and Shannon, 569.

Road materials: Snider, 505.

Structural materials: Gould *et al.*, 256.

Pyrite: Snider, 509.

Quana Mountain group: Snider, 505; Taff, 552.

Quartermaster formation: Gould, 228; Hutchison, 337; Matthews, 392; Snider, 514; Willis, 619.

Quaternary.

Stratigraphy.

General: Gould, 228; Hutchison, 337, 343.

Muskogee quadrangle: Taff, 557.

Tahlequah quadrangle: Taff, 545.

Wichita Mountains: Taff, 552.

Raggedy Mountains: Snider, 505; Taff, 552.

Rainy Mountain sulphur spring. *See* Springs.

Ralston anticline: Trout and Shannon, 569.

Ralston group: Gould *et al.*, 254; Hutchison, 337, 343; Snider, 504, 505; Willis, 619.

Ramona oil development: Trout and Shannon, 569.

Ramona formation: Nelson, 406; Ohern, 416.

Reagan sandstone: Eckes, 172; Gould, 226, 228; Hutchison, 343; Nelson, 406; Reeds, 450; Shannon and Trout, 482; Snider, 504, 505, 513; Taff, 542, 545; 552; Taff and Reed, 563; Wallis, 585; Willis, 619.

Paleontology: Taff, 542, 545.

Redbeds Region.

General geology: Adams, 6, 9, 12, 13, 16; Adams *et al.*, 20; Beede, 48, 55, 56, 57, 58, 59; Case, 105, 106, 107; Cragin, 136; Gould, 217, 220, 221, 224, 228; Hutchison, 337, 343; Munn, 401; Schwennesen, 474, 475; Shannon and Trout, 482; Sherwin, 486, 487; Snider, 504, 505, 514; Taff, 552, White, 615; Wallis, 585; Willis, 619.

Economic geology: Buttram, 101; Fath, 175; Gould, 218, 219, 222, 225, 228, 235, 248, 250; Gould *et al.*, 256; Haworth and Bennett, 276; Hutchison, 343; Munn, 401; Schwennesen, 474, 475; Shannon and Trout, 482; Snider, 504, 505, 511, 514; Taff, 552; Tarr, 565; Wegemann, 603, 604, 605.

Paleontology: Adams *et al.*, 20; Beede, 47, 48, 49, 52, 53, 54; Case, 104, 108; Girty, 199; Gould, 214.

Red Bird oil and gas area: Trout and Shannon, 569.

Red Bluff sandstone: Gould, 221; Willis, 619.

Red Fork oil and gas pool: Blatchley, 66; Hutchison, 343; Long, 374; Snider, 513; Trout and Shannon, 569.

Red Oak oil and gas development: Snider, 513.

Red River: Gordon, 208; Gould, 228; Hill, 308; Hinderlider *et al.*, 328, 329; Shumard, 493; Taff, 541, 542.

Red River Limestone Region.

General geology: Gould, 228; Gould *et al.*, 256; Hill, 301, 308, 313, 315, 319, 324; Hutchison, 343; Larkin, 368; Marcy, 390; Shannon and Trout, 482; Snider, 504, 505, 513; Taff, 542, 545, 552; Wallis, 585; Willis, 619.

Economic geology: Gould *et al.*, 256; Hutchison, 338, 343; Larkin, 368; Shannon and Trout, 482; Snider, 504, 505, 513; Taff, 542, 545; Taff and Reed, 563; Trout and Shannon, 569.

Paleontology: Hill, 321, 324; Larkin, 368.

Refineries: Shannon, 481; Shannon and Trout, 482; Snider, 513.

Reports.

Director, 1910: Gould, 243.

Director, 1912: Ohern, 418.

Director, 1914: Shannon, 481.

Governor, Oklahoma Territory, 1899: Barnes, 41.

Governor, Oklahoma Territory, 1900: Barnes, 42.

Oil Inspector, 1896: Mosely, 400.

Oil Inspector, 1902: Dillon, 166.

Territorial Geologist, 1901-1902: Van Vleet, 578.

Territorial Geologist, 1903-1904: Van Vleet, 579.

Rich Mountain: Taff, 542, 558.

River alluvium. *See* Alluvium.

River sand and gravel. *See* Sand and Gravel.

Roads. *See* Road materials.

Road materials. *See also under names of Counties.*

General: Gould *et al.*, 253, 255, 256; Reeds, 450; Shannon, 481; Snider, 505; Taff, 559.

Rock asphalt. *See* Asphalt.

Rogers County.

Oil and gas conditions: Snider, 513; Trout and Shannon, 569.

Rogers County.—(Continued).

Road materials: Snider, 505.

Structural materials: Gould *et al.*, 256.

Roger Mills County.

Gypsum: Clark, 113; Gould, 222, 225; Gould *et al.*, 253, 255, 256; Shannon, 481; Snider, 514.

Oil and gas conditions: Snider, 513; Trout and Shannon, 569.

Road materials: Snider, 505.

Structural materials: Gould *et al.*, 256.

Water supply: Gould, 228.

Salt. *See also under names of Counties.*

General: Gould *et al.*, 253, 255; Shannon, 481; Snider, 514.

Salt Creek oil and gas prospects: Trout and Shannon, 569.

Salt Fork division: Gould, 220.

Salt Fork River: Gould, 228.

Salt plains. *See* Plains.

Salt Plain member: Gould, 200; Snider, 514; Willis, 619.

Salt springs. *See* Springs.

Sand: Buttram, 100; Gould *et al.*, 253, 255; Reeds, 450; Shannon, 481; Snider, 505; Taff, 541, 545; Taff and Reed, 563.

Sand lime brick: Shannon, 479.

Sandstone: Buttram, 102; Gould *et al.*, 253, 255, 256; Ohern and Garrett, 419; Shannon, 481; Snider, 505, 509; Taff, 541, 542.

Sandstone Hills Region. (Northern section).

General geology: Adams, 10, 12, 16; Beede, 56, 59; Buttram, 102; Gould *et al.*, 254; Ohern, 416; Ohern and Garrett, 419; Purdue, 444; Reeds, 448; Severin, 478; Shannon and Trout, 482; Sieben-thal, 495; Smith, 499; Snider, 504, 505, 513; Taff, 555, 557; Wil-lis, 619; Wood, 632, 633.

Economic geology: Blatchley, 66; Buttram, 102; Gould, 232, 236, 249, 251; Gould *et al.*, 253, 256; Shannon and Trout, 482; Sieben-thal, 495; Snider, 504, 505, 513; Smith, 499; Wood, 633.

Paleontology: Beede, 51, 56, 59, 60, 61.

Sandstone Hills Region. (Southern section).

General geology: Chance, 110, 111; Drake, 167; Gould *et al.*, 254, 256; Hutchison, 343; Severin, 478; Shannon and Trout, 482; Smith, 498; Snider, 504, 505, 513, 515; Taff, 534, 537, 541, 542, 543, 546-551, 557; Taff and Adams, 562; Wallis, 585; Willis, 619.

Economic geology: Chance, 110, 111; Drake, 167; Fath, 176, 177; Gould, 232, 237, 240, 243, 249, 251; Gould *et al.*, 253; Hutchison, 343; Shannon and Trout, 482; Snider, 504, 505, 513, 515; Taff, 535, 537, 541, 542, 543, 546-551, 553, 554, 557; Taff and Adams, 562; Taff and Shaler, 564; Wallis, 585; Willis, 619.

Paleontology: Drake, 167; Girty, 196, 201, 203, 204; White, 612.

Sandstone springs. *See* Springs.

Sansbois syncline: Taff and Adams, 562.

Sapulpa district: Blatchley, 66; Severin, 478; Snider, 513.

Sapulpa group: Gould, 246; Hutchison, 343; Ohern, 416; Snider, 504, 505; Willis, 619.

Satin spar. *See* Gypsum.

Savanna anticline: Severin, 478; Snider, 515; Taff, 541; Taff and Adams, 562.

Savanna sandstone: Shannon and Trout, 482; Smith, 498; Snider, 504, 515; Taff, 541, 542, 543, 554; Taff and Adams, 562; Trout and Shannon, 569; Willis, 619.

Schulter-Henryetta oil and gas development: *See* Henryetta.

Second line of Gypsum Hills: Clark, 113; Gould, 222, 225; Gould *et al.*, 256; Shannon, 481; Snider, 514.

Sedimentary rocks. *See also under formation names.*

General: Eckes, 172; Gould, 221, 228; Hutchison, 337, 343; Snider, 505; Taff, 542, 545, 552.

Selenite. *See* Gypsum.

Seminole conglomerate: Shannon and Trout, 482; Taff, 541; Willis, 619.

Seminole County.

Oil and gas conditions: Hutchison,

Seminole County.—(Continued).

343; Snider, 513; Trout and Shannon, 569.

Road materials: Snider, 505.

Structural materials: Gould *et al.*, 256.

Senora formation: Shannon and Trout, 482; Snider, 504; Taff, 541; Willis, 619.

Sequoyah County.

Oil and gas conditions: Snider, 513; Trout and Shannon, 569.

Road materials: Snider, 505.

Structural materials: Gould *et al.*, 256.

Shale: Buttram, 102; Gould *et al.*, 253, 255; Ohern and Garrett, 419; Shannon, 481; Siebenthal, 495; Snider, 509; Taff, 552.

Shallow field: Hutchison, 343; Snider, 513.

Shamrock dome: Buttram, 102.

Sheer zones: Snider, 515; Taff and Adams, 562.

Sheet asphalt. *See* Asphalt.

Shimer Gypsum: Clark, 113; Gould, 222, 228; Hutchison, 337; Willis, 619.

Silo sandstone: Larkin, 368; Nelson, 406; Shannon and Trout, 482; Snider, 513; Taff, 542, 545, 552, 553, 555, 558; Willis, 619.

Siloam syncline: Snider, 515.

Silurian.

Stratigraphy.

General: Snider, 505; Taff, 553; Willis, 619.

Arbuckle Mountains: Reeds, 450; Taff, 552.

Atoka quadrangle: Taff, 542.

Northeastern Oklahoma: Siebenthal, 495; Snider, 509, 517.

Southeastern Oklahoma: Girty, 201.

Tahlequah quadrangle: Taff, 555.

Tishomingo quadrangle: Taff, 545.

Wichita Mountains: Taff, 552.

Paleontology.

Invertebrates: Girty, 196; Reeds, 451; Snider, 517; Taff, 552, 555.

Silver: Gould *et al.*, 253, 255; Reeds, 450; Shannon, 481.

Simpson formation: Eckes, 172; Hutchison, 343; Nelson, 406; Shannon and Trout, 482; Snider, 504, 505; Taff, 542, 545, 552; Taff and Reed, 563; Trout, 568; Wallis, 585; Willis, 619.

Palaeontology: Taff, 546; Trout, 568.

Skedee anticline: Trout and Shannon, 569.

Skiatook formation: Hutchison, 337; Ohern, 416; Severin, 478; Snider, 504.

Smithsonite: Snider, 509.

Soils: Gould, 221, 229; Munn, 401; Purdue, 444; Shannon, 481; Snider, 517; Taff, 542, 545, 555, 557.

Southwestern coal field: Taff, 543.

Spavinaw Creek, igneous rocks: Drake, 167; Gould, 221; Hutchison, 343; Snider, 517.

Sphalerite: Snider, 509.

Spirit leveling in Oklahoma: Marshall, 391.

Spiro gas development: Snider, 513; Trout and Shannon, 569.

Spiro syncline: Taff, 549.

Springfield structural plain: Taff, 555.

Springs: Gould, 228; Shannon, 481; Snider, 514.

Stanley shale: Hutchison, 343; Shannon and Trout, 482; Taff, 542, 558; Wallis, 585; Willis, 619.

Stanton limestone: Adams *et al.*, 20; Ohern, 416; Snider, 505.

State map: O. G. S., 423.

St. Clair marble: Nelson, 406; Snider, 517; Taff, 555, 557.

Stephens County.

Asphalt: Hutchison, 343.

Gypsum: Snider, 514.

Oil and gas conditions: Snider, 513; Trout and Shannon, 569.

Road materials: Snider, 505.

Structural materials: Gould *et al.*, 256.

Stigler coal: Taff, 547, 554, 558.

Stigler, oil and gas development near: Trout and Shannon, 569.

Stigler syncline: Snider, 515.

Stigler, volcanic dust near: Buttram, 101.

Stone: Gould *et al.*, 256.

Stratigraphy. (General) *See under names of Physiographic Provinces.*

McCann sandstone: Gould, 212.

North of parallel thirty-five degrees and thirty minutes: Hutchison, 337.

Pennsylvanian rocks of northeastern Oklahoma: Ohern, 416.

Northern Oklahoma: Adams *et al.*, 20.

Pawhuska quadrangle: Carpenter, 103.

Streams: Gould, 228; Shannon, 481.

Stringtown shale: Hutchison, 343; Shannon and Trout, 482; Taff, 542, 558; Wallis, 585.

Structural materials. *See under names of Counties.*

Stuart shale: Shannon and Trout, 482; Snider, 504; Taff, 541; Willis, 619.

Sugarloaf syncline: Smith, 498; Snider, 515; Taff, 562.

Sulphur springs: Gould, 228.

Sumner division: Cragin, 135; Gould, 228.

Swanson County.

Road materials: Snider, 505.

Structural materials: Gould *et al.*, 256.

Sycamore limestone: Hutchison, 343; Nelson, 406; Shannon and Trout, 482; Snider, 505, 513; Taff, 545, 552; Wallis, 585; Willis, 619.

Sylvan shale: Eckel, 171; Eckes, 172; Hutchison, 343; Nelson, 406; Shannon and Trout, 482; Snider, 504, 513; Taff, 542, 545, 552, 553; Taff and Reed, 563; Wallis, 585; Willis, 619.

Palaeontology: Taff, 545.

Tahlequah quadrangle: Taff, 555.

Talala oil and gas pool: Trout and Shannon, 569.

Talihina chert: Girty, 201; Hutchison, 343; Shannon and Trout, 482; Taff, 542, 558; Wallis, 585.

Taloga formation: Willis, 619.

Taneha oil and gas district: Trout and Shannon, 569.

Terrace sands: Taff, 545, 557.

Tertiary.

Stratigraphy.

General: Gould, 215, 221, 228, 245; Munn, 401; Sardeson, 464; Snider, 513, 514; Willis, 619.

Atoka quadrangle: Taff, 542.

Coalgate quadrangle: Taff, 541.

Texas County.

Oil and gas conditions: Snider, 513; Trout and Shannon, 569.

Road materials: Snider, 505.

Structural materials: Gould *et al.*, 256.

Thurman sandstone: Shannon and Trout, 482; Snider, 513; Taff, 541; Willis, 619.

Tiger Flats, oil and gas near: Trout and Shannon, 569.

Tillman County.

Oil and gas conditions: Snider, 513; Trout and Shannon, 569.

Road materials: Snider, 505.

Structural materials: Gould *et al.*, 256.

Tishomingo anticline: Taff, 545, 552.

Tishomingo granite: Gould *et al.*, 256; Hutchison, 343; Reeds, 450; Shannon and Trout, 482; Snider, 504; Taff, 542, 545, 552; Taff and Reed, 563; Taylor, 566.

Tishomingo quadrangle: Taff, 545.

Townsite pool: Hutchison, 343.

Trees and shrubs of Oklahoma: Shannon, 480.

Triangulation and spirit leveling: Fitch, 180.

Trinity sand: Buttram, 100; Hill, 301, 307; Larkin, 368; Nelson, 406; Shannon and Trout, 482; Snider, 513; Taff, 542, 545; Taff and Reed, 563; Willis, 619.

Palcontology: Hill, 307.

Tripoli: Gould, 238; Gould *et al.*, 253, 255; Shannon, 479, 481; Snider, 517.

Tulsa County.

Oil and gas conditions: Snider, 513; Trout and Shannon, 569.

Road materials: Snider, 505.

Structural materials: Gould *et al.*, 256.

Tulsa district: Blatchley, 66; Severin, 478; Snider, 513.

Tulsa group: Gould *et al.*, 254; Hutchison, 343; Ohern, 416; Snider, 504, 505; Willis, 619.

Turley oil and gas field: Hutchison, 343; Trout and Shannon, 569.

Tyner formation: Snider, 513, 517; Taff, 555, 557; Trout and Shannon, 569.

Uncas shale: Ohern and Garrett, 419; Shannon and Trout, 482; Snider, 513.

Underground water: Gould, 228, 244; Hill, 315; Long, 374; Sieben-
than, 495.

Verdigris River, geologic section: Hawthorn and Piatt, 281.

Vian anticline: Snider, 515.

Vian gas well: Snider, 513; Trout and Shannon, 569.

Vinita formation: Hutchison, 337; Ohern, 416; Severin, 478; Snider, 504.

Viola limestone: Eckel, 171; Eckes, 172; Gould, 226, 228; Hutchison, 343; Nelson, 406; Reeds, 450; Shannon and Trout, 482; Snider, 505, 513; Taff, 542, 545, 552, 553; Taff and Reed, 563; Wallis, 585; Willis, 619.

Palcontology: Taff, 545.

Vitrified brick. *See* Brick.

Volcanic dust: Buttram, 101; Gould *et al.*, 253, 255; Shannon, 481.

Analyses. *See under* Analyses.

Wagoner, development of oil and gas near: Trout and Shannon, 569.

Wagoner County.

Oil and gas conditions: Snider, 513; Trout and Shannon, 569.

Road materials: Snider, 505.

Structural materials: Gould *et al.*, 256.

Wainwright, oil and gas near: Trout and Shannon, 569.

- Wann formation: Ohern, 416.
- Wann oil and gas pool: Snider, 513; Trout and Shannon, 569.
- Wapanucka limestone: Gould *et al.*, 256; Nelson, 406; Shannon and Trout, 482; Snider, 505, 513; Taff, 541, 542, 552; Wallis, 585; Willis, 619.
- Wapanucka syncline: Taff, 542, 545, 552.
- Warner anticline: Snider, 515.
- Washington County.**
- Oil and gas conditions: Snider, 513; Trout and Shannon, 569.
- Road materials: Snider, 505.
- Structural materials: Gould *et al.*, 256.
- Washita County.**
- Gypsum: Clark, 113; Gould, 222, 225; Gould *et al.*, 253, 255, 256; Shannon, 481; Snider, 514.
- Oil and gas conditions: Snider, 513; Trout and Shannon, 569.
- Road materials: Snider, 505.
- Structural materials: Gould *et al.*, 256.
- Water supply: Gould, 228.
- Washita group: Larkin, 368.
- Washita River: Eckes, 172; Gould, 228.
- Washita syncline: Eckes, 172; Taff, 552.
- Water analyses. *See under Analyses.*
- Water supply.** *See also under names of Counties.*
- General:* Gould, 228; Gould *et al.*, 255; Ohern, 418; Purdue, 444; Shannon, 481; Siebenthal, 495; Snider, 517; Taff, 555, 557.
- Water wells. *See Underground water.*
- Watova limestone: Nelson, 406.
- Well records, table of: Buttram, 102.
- Weimer, prospecting for oil and gas near: Trout and Shannon, 569.
- Weleetka oil and gas development: Trout and Shannon, 569.
- Wellington shales: Adams *et al.*, 20; Clark, 113; Gould, 220; Hutchison, 337; Willis, 619.
- Western district: Snider, 505.
- Western Interior coal fields: Bain, 30, 34; Willis, 619.
- Wetumka shale: Shannon and Trout, 482; Snider, 504, 513; Taff, 541; Willis, 619.
- Wetumka, volcanic dust north of: Buttram, 101.
- Wewoka formation: Girty, 204; Shannon and Trout, 482; Snider, 504, 513; Willis, 619.
- Paleontology:* Girty, 203, 204.
- Wewoka oil and gas development: Snider, 513; Trout and Shannon, 569.
- Wheeler oil and gas field: Blatchley, 66; Hutchison, 343; Snider, 513; Trout and Shannon, 569.
- Wheeler sand: Buttram, 102.
- Whitehorse sandstone: Gould, 228; Willis, 619.
- Wicey oil and gas pool: Trout and Shannon, 569.
- Wichita formation: Gordon, 208.
- Wichita Mountain Region.**
- General geology:* Bain, 31; Comstock, 120; Gould, 221, 226, 228; Gould *et al.*, 253, 255, 256; Hutchison, 343; Nelson, 406; Shannon and Trout, 482; Snider, 505, 513; Taff, 552; Taylor, 566; Vaughan, 581; Wallis, 585; Willis, 619.
- Economic geology:* Bain, 36, 37, 38; DeBarr, 165; Gould, 226, 228; Gould *et al.*, 256; Snider, 505, 509, 513; Taylor, 566.
- Igneous rocks:* Taff, 552; Taylor, 566.
- Paleontology:* Weller, 606.
- Wilburton-Stigler district, segregated coal lands: Taff, 547.
- Willemite: Snider, 509.
- Wilson formation: Buttram, 102; Nelson, 405; Ohern and Garrett, 419; Schrader and Haworth, 471; Shannon and Trout, 482; Siebenthal, 495; Snider, 513.
- Windmills for irrigation: Murphy, 402, 403, 404.
- Winding Stairs Mountain: Taff, 558; Wallis, 585.
- Winfield limestone: Adams *et al.*, 20; Gould, 220; Ohern and Garrett, 419; Shannon and Trout, 482; Snider, 505, 513; Willis, 619.

Winslow formation: Nelson, 406; Purdue, 444; Snider, 504, 515, 517; Taff, 555, 557; Willis, 619.

Winslow quadrangle: Purdue, 444.

Witteville coal: Porter, 429; Shannon, 481; Taff, 543, 548, 554; Taff and Adams, 562.

Woodford chert: Eckes, 172; Hutchison, 343; Nelson, 406; Snider, 513; Taff, 542, 545, 552; Taff and Reed, 563; Trout and Shannon, 569; Wallis, 585; Willis, 619.

Paleontology: Girty, 102; Taff, 545.

Woods County.

Geology: Adams, 6.

Gypsum: Gould, 222, 225; Gould *et al.*, 253, 255, 256; Shannon, 481; Snider, 514.

Oil and gas conditions: Snider, 513; Trout and Shannon, 569.

Road materials: Snider, 505.

Structural materials: Gould *et al.*, 256.

Water supply: Gould, 228.

Woodward formation: Gordon, 208; Gould, 222, 228; Hutchison, 337; Shannon and Trout, 482; Snider, 505, 514; Willis, 619.

Woodville, "wildcat" drilling near: Trout and Shannon, 569.

Woodward County.

Gypsum: Clark, 113; Gould, 222, 225; Gould *et al.*, 253, 255, 256; Shannon, 481; Snider, 514.

Oil and gas conditions: Snider, 513; Trout and Shannon, 569.

Road materials: Snider, 505.

Salt: Shannon, 479.

Structural materials: Gould *et al.*, 256.

Volcanic dust: Buttram, 101.

Water supply: Gould, 228.

Wreford limestone: Adams *et al.*, 20; Gould *et al.*, 254; Hutchison, 337; Nelson, 406; Ohern and Garrett, 419; Shannon and Trout, 482; Snider, 505, 513; Willis, 619.

Wynona, oil and gas near: Trout and Shannon, 569.

Yale anticline north of: Trout and Shannon, 569.

Yellville formation: Adams, 17; Taff, 557.

Zinc: Bain, 32; Cross, 147; Gould *et al.*, 253, 255; Purdue, 444; Reeds, 450; Shannon, 481; Siebenthal, 495; Snider, 508, 509, 517.



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